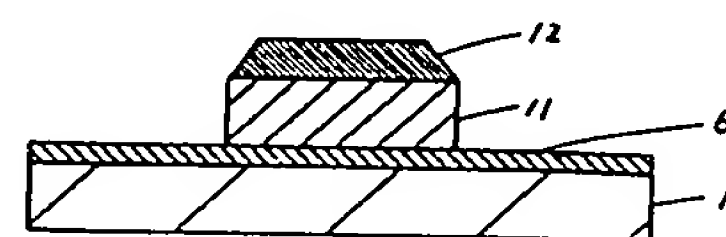
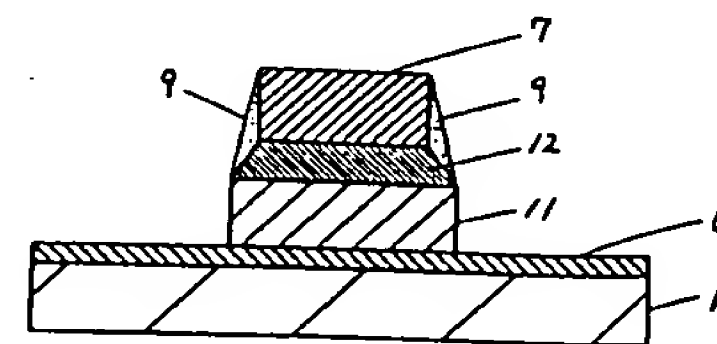


(54) DRY-ETCHING OF POLYSILICIDE STRUCTURE GATE LAMINATE FILM

(11) 1-239932 (A) (43) 25.9.1989 (19) JP
 (21) Appl. No. 63-68998 (22) 22.3.1988
 (71) SHARP CORP (72) RYOHEI KAWABATA(1)
 (51) Int. Cl. H01L21/302, H01L21/88, H01L29/78

PURPOSE: To form gate wiring which is rectangle-shaped in cross section and tapered at a upper end thereof by etching a gate laminate film composed of an upper layer silicide film and a lower layer polysilicon film using a predetermined etching gas.

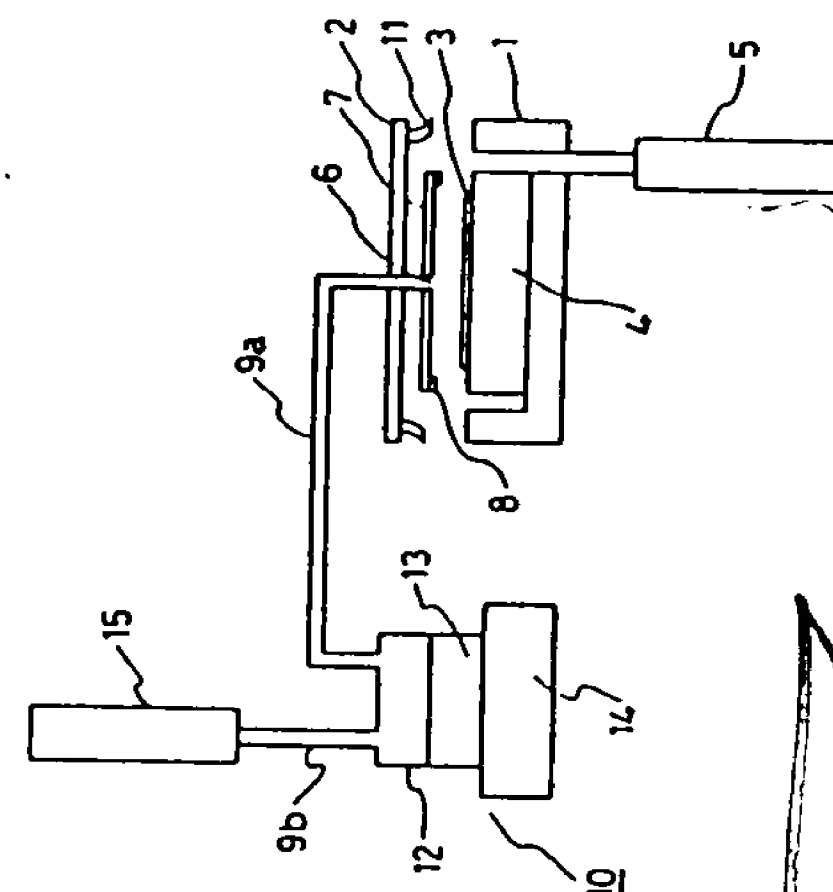
CONSTITUTION: A polysilicide structure gate laminate film composed of an upper silicide film 5 and a lower polysilicon film 11 both formed on a gate oxide film 6 on a substrate 1 is rendered to reactive ion etching by etching gas involving chlorine gas including a chlorine atom in a molecule and nitrogen gas using a resist pattern 7 as a mask. Hereby, an adherend 9 is formed during the etching on the side wall of the resist pattern 7 and on the side wall of the upper layer silicide film 12. When the adherend 9 and the resist pattern 7 are exfoliated, the upper layer silicide film 12 is etched into a trapezoid shape directed upward and into a rectangle shape in cross section with a tapered gate the upper end of which is pointed upward. Hereby, any current leakage between metal wiring and gate wiring is prevented from being produced together with elimination of variations of a gate length.

**(54) ASHING METHOD**

(11) 1-239933 (A) (43) 25.9.1989 (19) JP
 (21) Appl. No. 63-67779 (22) 22.3.1988
 (71) TOKYO ELECTRON LTD (72) SHUNICHI IIMURO(1)
 (51) Int. Cl. H01L21/302, H01L21/30

PURPOSE: To speed up an ashing treatment by carrying out the treatment with use of mixture gas of ashing gas involving ozone and of water vapor.

CONSTITUTION: Ashing gas involving ozone produced in an ozone producer 15 is allowed to flow into a gas/liquid mixing vessel 12 of gas/liquid mixing means 10 through an ashing gas supply tube 9b and further pass through the atmosphere of water vapor produced from vapor 13 introduced in the gas/liquid mixture vessel 12 for mixing of the water vapor therewith. The ashing gas involving the water vapor mixed therein is supplied from an opening 6 formed through a flat plate 7 to a heated water 3 surface to remove the film deposited on the wafer 3 surface. Thereupon, the ozone involved in the ashing gas is gradually decomposed. The decomposition of the ozone is accelerated because the mixed water vapor reduces the amount of the ozone, thereby producing oxygen radicals and hence speeding up the ashing treatment.



5: exhaust mechanism

(54) FORMATION OF FINE PATTERN

(11) 1-239934 (A) (43) 25.9.1989 (19) JP
 (21) Appl. No. 63-65907 (22) 22.3.1988
 (71) HIKARI GIJUTSU KENKYU KAIHATSU K.K.
 (72) SHIGEKI TAKAHASHI(2)
 (51) Int. Cl. H01L21/302

PURPOSE: To form a fine pattern on a substrate to be processed by irradiating a substrate surface rotating in a substrate plane with particles contributing to etching at a certain angle and transferring, after scaling down, a pattern formed on a second mask layer onto a first mask layer.

CONSTITUTION: A first mask layer 12 and a second mask layer 13 are formed on a substrate 11 to be processed, and then a striped mask pattern is formed on the same. With the substrate 11 rotated in a substrate plane, a substrate 11 surface is irradiated with an ion at an angle of about 30° with respect to a direction perpendicular to the substrate surface. Hereby, the first mask layer 12 is dry-etched using the second mask layer 13 as a mask to process the first mask layer 12 corresponding to an opening portion of the second mask layer 13 into a cone shaped in its cross section. In succession, the substrate 11 surface is irradiated with an ion vertically to dry-etch the substrate 11 using the first mask layer as a mask. Hereby, the pattern formed on the second mask layer 13 can be scaled down and transferred onto the first mask layer 12 to form a fine pattern on the substrate 11 without fine patterning of such a mask.

